

IN THE ABSTRACT:

A conjugate pair of intermeshing rotors ~~having~~ include helical lobes having helical crests and intervening grooves and are adapted for rotation about parallel axes within a working space of a screw rotor machine. Each rotor has a tip circle, a pitch circle, and a root circle. One, ~~one~~ rotor of each pair ~~being~~ is a female rotor formed such that ~~the~~ a major portion of each lobe of ~~said~~ the female rotor is located inside the pitch circle of the female rotor. The other rotor is a male rotor formed such that ~~the~~ a major portion of each lobe of ~~said~~ the male rotor is located outside ~~said~~ the pitch circle of the male rotor. The lobes of one rotor follow the grooves of the other rotor to form a continuous sealing line between ~~said~~ the pair of rotors. Each, ~~each~~ of the lobes ~~having~~ have a primary flank portion and a secondary flank portion. The, ~~wherein~~ the primary flank portion of ~~said~~ the lobes of the female rotor have a profile formed from at least one ellipse, and the primary flank portion of the lobes of the male rotor have a profile formed from at least one ~~ellipses~~ ellipse.